MISCELLANEA ZOOLOGICA HUNGARICA

Tomus 1. 1982 p. 139-150

A general report on a collecting trip to Ethiopia

By

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(Received June 30, 1981)

ABSTRACT. A report on a 3-month zoological collecting trip to Ethiopia is given. An itinerary, description of collecting localities and a numbered list of zoological samples excluding vertebrates are presented.

INTRODUCTION

Ethiopia has always been of considerable interest to naturalists. The Hungarian Natural History Museum organized three zoological expeditions to this country during the first two decades of this century: Kálmán KITTENBERGER in 1907 (DEMETER &TOPÁL, 1982) and Ödön KOVÁCS in 1911-13, and then from 1914 to his mysterious death in 1919, during the course of which valuable collections of insects, mammals and especially birds were acquired. Later, smaller collections of mammals and birds were presented to the H.N.H.M. by Dr. Kálmán MÉSZÁROS and Mátyás GAJDÁCS (KEVE, 1968).

This paper is a general report on a three-month zoological collecting trip which I made to Ethiopia upon the invitation of my parents, Dr. György DEMETER and Dr. Erzsébet FEKETE, who, as medical doctors, work in that country under the auspices of an inter-state aid programme. My wife, Tünde DEMETER accompanied me on my trip and took more than her share of the collecting activities. This report is divided into three parts: first a general account of the events of the collecting trip is given, which is followed by a numbered list of the zoological samples with all the relevant information. In the closing part, descriptions of the collecting localities are given. The vertebrates collected on this trip will be the subject of a separate communication.

ITINERARY

We departed from Ferihegy Airport of Budapest on the 12th of September, 1980, and changing flights in Rome, arrived at Bole Airport, Addis Ababa early morning on the next day. A weekend, and a national holiday commemorating of the sixth anniversary of the Ethiopian Revolution gave us ample time to acclimatize ourselves to the high-altitude location of Addis Ababa, the capital of Ethiopia, and to have a rest after the journey.

Before embarking on collecting trips, I paid a visit of the Wildlife Conservation Organization to obtain the necessary permits to carry out such activities. There I met the General Manager, who informed me of the hunting ban that was in effect in Ethiopia at that time. Referring to the paragraphs of the wildlife regulations, which include all kinds of wild animals as game, he declined to give permission even for collecting insects and small mammals for scientific purposes. This was an unexpected turn of events which seriously jeopardized the success of the whole trip. My reasoning, that the zoological collectings which I was to do on the behalf of the Hungarian Natural History Museum could not in any sense be called hunting, was all in vain. Realizing that only higher authority would be entitled to issue any such permits, with the active support of the embassy of the Hungarian People's Republic in Addis Ababa, I obtained the consent of the

Permanent Secretary of the Ministry of Agriculture directing the Wildlife Conservation Organization and provided me with the necessary permits and a supporting letter necessary for my travels.

In possession of the necessary permits, I began collecting. My parents' suburban house in the Old Airport district of Addis Abbaba was my base, from where I travelled to various parts of the country. Here, in the garden I also obtained various smaller collections of insects throughout my intermitten stay.

During the first field trip from the 18th to the 21st of September, we visited the region around Dessie, Wollo province, 400 km north of Addis Ababa. For about 200 km, the main road leading north from the capital passes through the typical landscape of the Ethiopian Plateau at 2500-3000 a.s.l., then it descends sharply down to the Rift Valley. Between Robi and Kombolcha we passed through medium-altitude valleys densely populated and heavily farmed, then ascended the plateau again, to reach the small mountain town of Dessie. Here I collected insects and small mammals in a steep, narrow valley 8 km south of the township. On the 19th, we visited Lake Haik, 30 km north of the town and on the 20th we drove eastwards towards the Dankali. Before turning back in the afternoon, we reached as far east as 11 km past of Bati. The road from Kombolcha gently descends eastwards, but at Bati one passes a watershed and from there on the country is definitely more arid than west of the village. Rough, rolling hilly country with sparse Acacia scrubs is the dominant landscape. On the way back from Dessie, we made a number of stops, when I collected soil samples, netted insects from vegetation, etc.

From the 22nd of September to the 3rd October I collected in the environs of Addis Ababa, principally around the Akaki river, south of the city. I am most grateful to Mr. and Mrs. M. MOCK for allowing me to collect in their extensive park above the river.

On the 5th of October, we visited the popular resort, Sodere, 120 km southeast of the capital, where I collected insects and soil samples.

During my intermitten stay in Addis Ababa, I made the acquaintance of Ato GETACHEW ASEFA at the Institute of Agricultural Research engaged in applied rodent research with emphasis on the problems of pest control. He invited me to accompany him and his technician, Ato FANTAHUN F. on a number of field trips, the first of which took place on the 7th and 8th of October to Koka, 100 km south of Addis Ababa.

From the 12th to the 17th of October we visited Lake Langano, 210 km south of Addis Ababa. At various points in the Rift Valley en route to this popular resort, we made brief stops to collect insects and soil samples.

On the 18th of October, we made a one-day trip to the Blue Nile Gorge, 200 km north-northeast of the capital. Brief stops during the journey at various points along the route enabled me to obtain samples from a variety of habitats.

Koka was a successful place for collecting, so on the 21st and the 22nd of October, I again joined Ato GETACHEW and Ato FANTAHUN to collect small mammals and insects on the shore of Lake Koka.

We joined a party of members of the Ethiopian Natural History Society on the 26th of October on a Sunday track to Mount Menagesha, 30 km from Addis Ababa.

A visit to the Southern Highlands took place at the end of October and the beginning of November. We left for the Bale National Park on the 30th of October and passed through the by then familiar road in the Rift Valley and spent a night at Langano. Starting for Dinshu early next morning, we ascended the southern highlands to reach a 3200 m high plateau, where we spent three days in a mountain cabin built by the Wildlife Conservation Organization. I collected small mammals, insects and soil samples. On the second day of our visit, we made a 30 km horse-ride watching game: the Mountain Nyala were plentiful, and we also spotted Menelik's bushbuck, reedbuck, hyrax and jackal. On our way back to Addis Ababa, we passed through Asella on the eastern slope of the Rift Valley.

From the 5th to the 11th of November, we visited the Awash National Park, where we enjoyed the friendly guidence of Ato DAGNEW DANIEL, the assistant game warden. We stayed at Kerrayu Lodge in comfortable trailers, and trapped for small mammals along the Awash river and in dry Acacia scrub east of Metahara. Insect collections were made in the gallery forest of the river and in the upland steppe. On the 9th, we made a long tour around the northern part of the park, with a brief stop at Filwoha hot springs to wash off the dust of the drive.

Our brief visit to Sodere in October convinced me that further collecting need to be done in that area, so from the 15th to the 19th November we stayed in a bungalow at the camping site of the resort. I trapped for small mammals in the gallery forest of the river and in dry Acacia scrub, collected soil samples an insects.

Brief stops during a one-day drive to and from Ambo, 120 km west of the capital permitted me to obtain samples of insects and soil for extraction.

The last one of the longer field trips took place on the 29th and 30th of November, when I joined the team from the Institute of Agricultural Research on their trip to Indibir, west of Addis Ababa. Besides collecting in habitats typical for the plateau, I also made a brief excursion to the valley of the Gibe river, some 500 m below the elevation of the plateau.

In December, we made two short, one-day trips. On the 2nd, we visited Lake Hora at Debre Zeit, 50 km east of the capital, where we collected insects and plankton samples around the volcanic lake. On the next day, we paid a visit to the Menagesha State Forest, where we parked our vehicle in Juniperus forest at an elevation of about 2700 m and tracked up to the alpine grassland zone of Mount Wuchacha to about 3200 m. We collected insects by sweeping the vegetation, turning over stones, sifting litter and by singling.

The last week of our stay in Ethiopia was taken up by packing the collected material and obtaining the necessary permits for exportation. We left Addis Ababa on the 11th of December and took a long flight to Athens, stopping in Asmara, Khartoum and Cairo. Our connection from Athens to Budapest was due only two days later, so we arrived at Ferihegy Airport in the morning of the 13th, with all the collection safe and intact.

LIST OF SAMPLES

No. 1. Addis Ababa, suburban garden, 16 Sept. - Singled from a hedge of roses.
No. 2. Same locality and date. - Netted above cattle dung.
No. 3. Same locality and date. - Beaten from a hedge of roses.
No. 4. Same locality and date. - Collected at the light of a 160 KW MV lamp.
No. 5. Same locality, 17 Sept. - Netted above fresh cattle dung.
No. 6. Same locality and date. - Swept from weeds.
No. 7. Same locality and date. - Swept from climbing vegetation of stone hedge.
No. 8. cca. 15 km south of Robi, 18 Sept. - Singled in dry Acacia woodland with fields of maize and millet.
No. 9. Same locality and date. - Swept from undergrowth of Acacia woodland.
No. 10. Lake Haik, 19 Sept. - Sample of planktons from lake.
No. 11. Same locality and date. - Singled on shore of lake.
No. 12. Dessie, 19 Sept. - Singled in hotel garden.
No. 13. Same locality and date. Singled in hotel room.
No. 14. 8 km south of Dessie, 19 Sept. Swept from vegetation in steep, narrow valley.
No. 15. Same locality and date. - Singled.
No. 16. Same locality, 20 Sept. - Singled.
No. 17. Same locality and date. - Swept from vegetation.
No. 18. 11 km east of Bati, 20 Sept. - Sample consisting of fragments from a termite mound, dry cattle dung and soil, extracted in Berlese funnel.
No. 19. 8 km south of Dessie, 20 Sept. - Soil sample from side of road with profuse herbaceous cover, extracted in Berlese funnel.
No. 20. Same locality and date. - Soil sample of steep, narrow valley, extracted in Berlese funnel.
No. 21. 11 km east of Bati, 20 Sept. - Singled.
No. 22. Same locality and date. - Singled.
No. 23. Same locality and date. - Swept from dry scrubby vegetation.
No. 25. Karakore, 21 Sept. - Sample of planktons from edge of marsh near hot spring.
No. 26. Same locality and date. - Netted above fresh cattle dung.
No. 27. Same locality and date. - Soil sample, extracted in Berlese funnel.
No. 28. Robi, 21 Sept. - Soil sample from edge of teff field, extracted in Berlese funnel.
No. 29. Debre Sina, 21 Sept. - Soil sample, extracted in Berlese funnel.
No. 30. Same locality and date. - Soil sample, extracted in Berlese funnel.
No. 31. 20 km south of Debre Sina, 18-21 Sept. - Collected in pitfall traps baited with beer.
No. 32. 30 km north of Debre Berhan, 21 Sept. - Soil sample from grassland, extracted in Berlese funnel.
No. 41. Robi, 21 Sept. - Singled in dry Acacia woodland.
No. 42. "Baboon Gorge", south of Debre Sina, 21 Sept. - Singled.

No. 43. Addis Ababa, suburban garden, 22 Sept. - Singled.
No. 44. 8 km south of Dessie. - Collected in pitfall traps baited with beer.
No. 46. Addis Ababa, suburban garden, 23 Sept. - Collected at the light of a 160 KW MV lamp.
No. 51. Same locality and date. - Singled in house.
No. 52. Same locality, 27 Sept. - Singled.
No. 57. Same locality and date. - Singled.
No. 66. Same locality, 29 Sept. - Singled.
No. 67. Akaki river, Addis Ababa, 29 Sept. - Collected at the light of a 160 KW MV lamp.
No. 75. Same locality and date. - Netted above horse dung.
No. 76. Same locality and date. - Netted above fresh horse dung.
No. 81. Same locality, 28 Sept. - Sample of soil containing decaying wood, extracted in Berlese funnel.
No. 82. Same locality and date. - Soil sample from meadow, extracted in Berlese funnel.
No. 83. Same locality and date. - Humidified substance, extracted in Berlese funnel.
No. 84. Same locality and date. - Soil sample from gallery forest, extracted in Berlese funnel.
No. 85. Same locality and date. - Soil sample from lawn, extracted in Berlese funnel.
No. 86. Same locality and date. - Soil sample from herbaceous vegetation, extracted in Berlese funnel.
No. 87. Same locality and date. - Soil sample from undergrowth near river, extracted in Berlese funnel.
No. 88. Same locality and date. - Soil sample from grassland extracted in Berlese funnel.
No. 92. Same locality, 30 Sept. - Singled.
No. 93. Same locality and date. - Swept from undergrowth beneath Eucalyptus trees.
No. 94. Same locality and date. - Swept from bushy vegetation in gallery forest.
No. 95. Same locality and date. - Collected in pitfall traps baited with beer in gallery forest and grassy undergrowth of Eucalyptus woodland.
No. 100. Same locality, 3 Oct. - Collected in pitfall traps baited with beer.
No. 101. Addis Ababa, suburb, 4 Oct. - Swept from weedy vegetation.
No. 102. Same locality and date. - Singled.
No. 103. Same locality, 3 Oct. - Singled.
No. 104. Sodere, bank of Awash river, 5 Oct. - Soil and litter sample from gallery forest, extracted in Berlese apparatus.
No. 105. Same locality and date. - Swept from bushes and low trees in gallery forest.
No. 106. Same locality and date. - Soil sample from bank of river, extracted in Berlese funnel.
No. 107. Same locality and date. - Fragments from termite mound, extracted in Berlese funnel.
No. 108. Same locality and date. - Sample of decaying wood, extracted in Berlese funnel.
No. 109. Same locality and date. - Singled.
No. 110. Same locality and date. - Soil sample, extracted in Berlese funnel.
No. 111. Addis Ababa, suburb, 4 Oct. - Singled.
No. 112. Sodere, 5 Oct. - Termites singled from same mound that was extracted in Sample No. 110.
No. 114. Akaki river, Addis Ababa, 6 Oct. - Swept from grass and undergrowth in Eucalyptus woodland.
No. 115. Same locality and date. - Swept from vegetation of fallowland overgrown with legumes.
No. 120. Same locality and date. - Swept from an old-field habitat near river.
No. 121. Same locality and date. - Swept from low herbaceous vegetation near river.
No. 122. Same locality and date. - Netted above horse dung.
No. 123. Same locality and date. - Singled from sifted material.
No. 124. Addis Ababa, suburb, 6 Oct. - Singled in house.
No. 125. Akaki river, Addis Ababa, 6 Oct. - Singled.
No. 126. Addis Ababa, suburb, 6 Oct. - Collected at the light of a 160 KW MV lamp.
No. 127. Akaki river, Addis Ababa, 6 Oct. - Singled.
No. 128. Addis Ababa, suburb, 7 Oct. - Singled in garden.
No. 129. Koka, 7 Oct. - Swept from low bushy vegetation of lake shore.
No. 140. Modjo, 7 Oct. - Singled from hotel room.
No. 162. Koka, 8 Oct. - Collected in pitfall traps (10) baited with beer in Acacia and Balatina woodland.
No. 163. Same locality and date. - Sample of soil, humus and litter from base of Opuntia, extracted in Berlese funnel.

No. 164. Same locality and date. - Sample of soil and humus from base of Acacia tree, extracted in Berlese funnel.
No. 165. Same locality and date. - Decaying wood attacked by termites, extracted in Berlese funnel.
No. 166. Same locality and date. - Old cattle dung and sample of soil from beneath it, extracted in Berlese funnel.
No. 167. Same locality and date. - Swept from vegetation at edge of Acacia woodland.
No. 168. Same locality and date. - Swept from low herbaceous vegetation on lake shore.
No. 169. Same locality and date. - Singled from beneath cattle dung.
No. 170. Akaki river, Addis Ababa, 9 Oct. - Singled at night on stone-and-gravel bank of river.
No. 171. Addis Ababa, suburb, 9 Oct. - Singled in garden.
No. 172. Akaki river, Addis Ababa, 6 Oct. - Sifted material from decaying litter in Eucalyptus and Juniperus woodland extracted in Moczarsky-Winkler apparatus.
No. 173. Addis Ababa, suburb, 10 Oct. - Singled in garden.
No. 175. Lake Langano, 12 Oct. - Ectoparasites collected from bats.
No. 176. Same locality and date. - Singled in Acacia woodland on lake shore.
No. 182. Same locality and date. - Collected at a vapour-pressure lamp on lake shore.
No. 189. Same locality and date. - Singled.
No. 190. Same locality and date. - Netted above fresh cattle dung.
No. 191. Same locality and date. - Swept from herbaceous undergrowth in Acacia woodland.
No. 215. Same locality, 13 Oct. - Singled in the afternoon and at night on gravel of lake shore.
No. 216. Same locality, 14 Oct. Collected in 10 pitfall traps baited with beer.
No. 218. Same locality and date. - Singled from beneath bark of dead tree.
No. 219. Same locality and date. - Singled.
No. 224. Lake Abiata, 15 Oct. - Sample of planktons.
No. 231. Lake Langano, 15 Oct. - Swept from herbaceous undergrowth of Acacia woodland.
No. 232. Same locality and date. - Swept from herbaceous undergrowth of Acacia woodland in the evening.
No. 233. Same locality and date. - Singled from gravel of lake shore.
No. 234. Same locality and date. - Singled in and around tent on lake shore.
No. 235. Same locality and date. - Sample of soil and litter, extracted in Berlese funnel.
No. 236. Same locality and date. - Decaying wood inhabited by a colony of ants, extracted in Berlese funnel.
No. 237. Same locality and date. - Cattle dung, extracted in Berlese funnel.
No. 238. Same locality and date. - Litter and soil sample from dense lake-side woodland, extracted in Berlese funnel.
No. 239. Same locality and date. - Soil and litter sample from Acacia woodland, extracted in Berlese funnel.
No. 240. Same locality and date. - Sample of soil and litter from base of Opuntia bush, extracted in Berlese funnel.
No. 241. Same locality and date. - Sample of soil and litter from rock ledges above lake, extracted in Berlese funnel.
No. 242. Same locality and date. - Decaying wood, extracted in Berlese funnel.
No. 243. Same locality and date. - Collected at the light of a 160 KW MV lamp.
No. 247. Same locality, 17 Oct. - Collected in 13 pitfall traps baited with beer, 3 traps baited with putrid meat in Acacia woodland.
No. 248. Same locality and date. - Sample of plankton from lake.
No. 249. 5 km north of Bulbula, 17 Oct. - Soil sample, extracted in Berlese funnel.
No. 250. Same locality and date. - Decaying wood, extracted in Berlese funnel.
No. 251. Same locality and date. - Decaying bracket fungus and bark of tree, extracted in Berlese funnel.
No. 252. Same locality and date. - Soil sample from base of Acacia tree, extracted in Berlese funnel.
No. 253. Same locality and date. - Swept from thin vegetation in sparse Acacia woodland.
No. 254. Lake Zwai, 17 Oct. - Sample of planktons from lake.
No. 255. 5 km north of Meki, 17 Oct. - Soil sample, extracted in Berlese funnel.
No. 256. Same locality and date. - Inside of termite mound, extracted in Berlese funnel.
No. 257. Same locality and date. - Swept from thin vegetation in grassland with many termite mounds and few scattered Acacia trees.

No. 258. Lake Langano, 17 Oct. - Singled.
No. 259. Addis Ababa, suburban garden. - Lepidoptera singled by Dr. G. DEMETER in July, 1980.
No. 260. Shafartak Bridge, Blue Nile (= Abbai) Gorge, 18 Oct. - Swept from herbaceous vegetation on north bank of the valley.
No. 261. Degen, 18 Oct. - Soil sample from teff field, extracted in Berlesen funnel.
No. 262. Shafartak Bridge, Blue Nile (= Abbai) Gorge, 18 Oct. - Swept from Rumex herbs.
No. 263. Same locality and date. - Swept from riparian vegetation of small stream (name unknown to me).
No. 264. Goha Tsion, 18 Oct. - Soil sample, extracted in Berlese funnel.
No. 265. Gebre Gurache, 18 Oct. - Swept from vegetation of mountain grassland.
No. 266. Fiche, 18 Oct. - Swept from vegetation of mountain grassland.
No. 268. Shafartak Bridge, Blue Nile (= Abbai) Gorge, 18 Oct. - Singled.
No. 269. Koka, 21 Oct. - Swept from low lake-side vegetation.
No. 270. Same locality and date. - Swept from undergrowth in Acacia woodland.
No. 271. Same locality and date. - Sample of planktons from lake.
No. 272. Same locality and date. - Collected in 9 pitfall traps baited with beer.
No. 273. Same locality, 21 Oct. - Collected at vapour-pressure lamp of hotel.
No. 274. Same locality, 20 Oct. - Singled on lake shore.
No. 275. Addis Ababa, suburban garden, 26 Oct. - Singled.
No. 287. Mount Menagesha, 26 Oct. - Swept from forest meadows at summit.
No. 288. Same locality and date. - Swept from grassland at foot of mount (2500 m).
No. 290. Same locality and date. - Singled.
No. 291. Addis Ababa, suburban garden, 26 Oct. - Singled.
No. 292. Same locality and date. - Collected at the light of a 160 KW MV lamp.
No. 318. Dinshu, Bale mountains, 1 Nov. - Soil sample, extracted in Berlese funnel.
No. 319. Same locality and date. - Tachyoryctes mound, extracted in Berlese funnel.
No. 320. Same locality and date. - Moss and bark from Juniperus, extracted in Berlese funnel.
No. 321. Same locality and date. - Mat of mosses, extracted in Berlese funnel.
No. 322. Same locality and date. - Litter sample, extracted in Berlese funnel.
No. 323. Same locality and date. - Soil sample from alpine meadow, extracted in Berlese funnel.
No. 324. Same locality and date. - Bark of Juniperus, extracted in Berlese funnel.
No. 325. Same locality and date. - Bark of Hagenia, extracted in Berlese funnel.
No. 354. Same locality and date. - Collected at the light of a 160 KW MV lamp.
No. 355. Same locality and date. - Singled from cattle dung.
No. 356. Same locality and 2 Nov. - Collected in 9 pitfall traps baited with beer.
No. 357. 11 km west of Dinshu, Bale mountains, 2 Nov. - Collected in 10 pitfall traps baited with beer.
No. 358. Mount Gaysay, Bale mountains, 1 Nov. - Swept from lush vegetation of grassland at foot of mount.
No. 359. 11 km west of Dinshu, Bale mountains, 2 Nov. - Swept from Alchemilla vegetation.
No. 362. Addis Ababa, suburban garden, 3 Nov. - Singled from carcass.
No. 374. Same locality, 4 Nov. - Singled.
No. 375. Akaki river, Addis Ababa, 4 Nov. - Collected at the light of a 160 KW MV lamp.
No. 379. Awash river, Awash National Park, 6 Nov. - Singled from river and bank of river.
No. 380. Kereyu Lodge, Awash National Park, 8 Nov. - Collected in 10 pitfall traps baited with beer, fresh dung and meat.
No. 395. Same locality, 7 Nov. - Ectoparasites singled.
No. 406. Awash river, Awash National Park, 8 Nov. - Collected in 10 pitfall traps baited with beer, fresh dung and meat.
No. 410. Same locality and date. - Singled from riparian vegetation.
No. 411. Same locality and date. - Swept from bushy vegetation on bank of river.
No. 413. Illala Sala, Awash National Park, 8 Nov. - Collected in 10 pitfall traps baited with beer, fresh dung and meat.
No. 414. Same locality and date. - Swept from low grass.
No. 427. Sabober Plains, Awash National Park, 9 Nov. - Dead millipede singled in cave.
No. 439. Illala Sala, Awash National Park, 9 Nov. - Collected in 2 pitfall traps baited with beer in Acacia scrub.

No. 441. Awash river, Awash National Park, 10 Nov. - Collected in 10 pitfall traps baited with beer in gallery forest of river.
No. 442. Same locality and date. - Decaying pieces of bark, extracted in Berlese funnel.
No. 443. Same locality and date. - Decaying log, extracted in Berlese funnel.
No. 444. Same locality and date. - Decaying bracket fungus, extracted in Berlese funnel.
No. 445. Same locality and date. - Soil and litter sample from gallery forest, extracted in Berlese funnel.
No. 446. Same locality and date. - Litter and decaying wood, extracted in Berlese funnel.
No. 447. Same locality and date. - Collected in 2 pitfall traps baited with dung.
No. 448. Same locality and date. - Soil sample from islet in river, extracted in Berlese funnel.
No. 449. Same locality and date. - Swept from vegetation of islet.
No. 450. Illala Sala, Awash National Park, 10 Nov. - Collected in pitfall traps baited with beer.
No. 451. Awash river, Awash National Park, 10 Nov. - Singled from vegetation of gallery forest.
No. 452. Lake Baa-sa-ka, 10 Nov. - Sample of planktons from lake.
No. 453. Illala Sala, Awash National Park, 10 Nov. - Collected in pitfall traps baited with dung and meat.
No. 454. Same locality and date. - Swept from low grass.
No. 455. Same locality, 11 Nov. - Singled at night.
No. 458. Addis Ababa, suburban garden, 12 Nov. - Singled.
No. 459. Akaki river, Addis Ababa, 13 Nov. - Singled.
No. 460. Same locality and date. - Netted above cattle and horse dung.
No. 461. Same locality and date. - Swept from tall grass.
No. 462. Same locality, 14 Nov. - Netted above horse dung.
No. 463. Same locality, 16 Nov. - Collected in pitfall traps baited with beer, dung and meat.
No. 464. Addis Ababa, suburban garden, 16 Nov. - Singled in house.
No. 469. Sodere, 16 Nov. - Collected at the light of a 160 KW MV lamp.
No. 502. Same locality, 17 Nov. - Collected in pitfall traps baited with beer in gallery forest.
No. 503. Same locality and date. - Collected at the light of a 160 KW MV lamp.
No. 504. Same locality and date. - Swept from dry grass in Acacia scrub in the afternoon.
No. 505. Same locality and date. - Swept from undergrowth and bushes in gallery forest in the afternoon.
No. 508. Same locality, 18 Nov. - Swept from dry grass in Acacia scrub in the morning.
No. 509. Same locality and date. - Swept from undergrowth and bushes in gallery forest in the morning.
No. 510. Addis Ababa, suburban garden, 20 Nov. - Collected at the light of a 160 KW MV lamp.
No. 511. Holetta, 23 Nov. - Swept from lush vegetation of mountain grassland.
No. 512. Ginchi, 23 Nov. - Swept from sparse grass cover of stony plain.
No. 513. Ambo, 23 Nov. - Swept from bushy vegetation and lush grass around spring.
No. 514. Addis Ababa, suburb, 24 Nov. - Singled in house.
No. 520. Ambo, 23 Nov. - Singled.
No. 521. Akaki river, Addis Ababa, 23 Nov. - Singled.
No. 522. Addis Ababa, suburban garden, 22 Nov. - Singled.
No. 523. Same locality, 28 Nov. - Singled.
No. 526. Gibe river, 30 Nov. - Swept from dry grass in river valley.
No. 531. Indibir, 30 Nov. - Swept from sedges around marshy puddle nearby house.
No. 532. 10 km northeast of Indibir, 30 Nov. - Swept from fallow farmland and undergrowth of Eucalyptus stand.
No. 533. Same locality and date. - Singled from inflorescences.
No. 534. Addis Ababa, suburb, 1 Dec. - Singled in house.
No. 535. Meta Ambo, 1 Dec. - Singled from rocky pool beneath water fall.
No. 536. Lake Hora, Debre Zeit, 2 Dec. - Sample of planktons from lake.
No. 537. Same locality and date. - Singled.
No. 538. Same locality and date. - Singled from beneath stones and rocks.
No. 539. Same locality and date. - Swept from dry grass.
No. 540. Same locality and date. - Swept from bushes and undergrowth in lake-side woodland.
No. 541. Menagesha forest, Mount Wuchacha, 3 Dec. - Soil and litter sample from base of Juniperus tree, extracted in Berlese funnel.

No. 542. Same locality and date. - Diptera larvae netted in water.
No. 543. Same locality and date. - Mat of mosses, extracted in Berlese funnel.
No. 544. Same locality and date. - Soil sample with mat of grass and moss, extracted in Berlese funnel.
No. 545. Same locality and date. - Decaying wood, extracted in Berlese funnel.
No. 546. Same locality and date. - Moss and decaying wood, extracted in Berlese funnel.
No. 547. Same locality and date. - Soil sample from forest meadow, extracted in Berlese funnel.
No. 548. Same locality and date. - Heart of decaying and partly mineralized wood, extracted in Berlese funnel.
No. 549. Same locality and date. - Mat of mosses from Juniperus tree, extracted in Berlese funnel.
No. 550. Same locality and date. - Sifted material (litter, moss, decaying wood), extracted in Moczarsky-Winkler apparatus.
No. 551. Same locality and date. - Singled in transitional vegetation between Juniperus and Erica arborea zone.
No. 552. Same locality and date. - Singled from under stones in ericaceous and afro-alpine zone.
No. 553. Same locality and date. - Swept from undergrowth in Juniperus forest.
No. 554. Same locality and date. - Swept from foliage of Juniperus trees.
No. 555. Some locality and date. - Swept from grass and foliage of bushes in heather zone.
No. 556. Same locality and date. - Swept from grasses in alpine grassland.
No. 557. Same locality and date. - Swept from Lobelia at higher altitute in Juniperus forest.

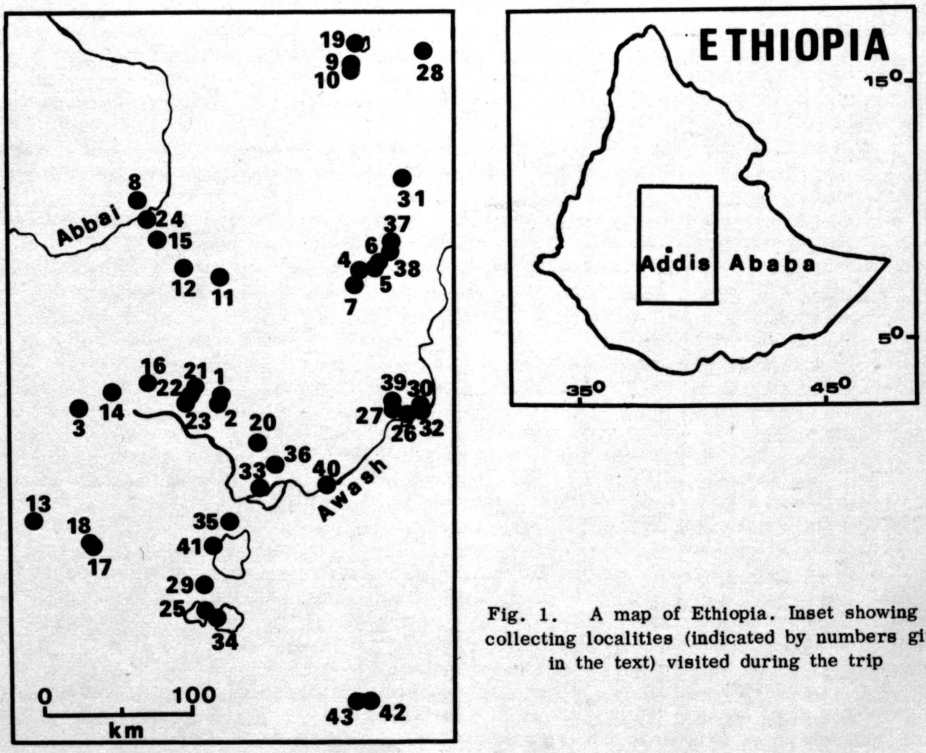

Fig. 1. A map of Ethiopia. Inset showing the collecting localities (indicated by numbers given in the text) visited during the trip

DESCRIPTION OF THE COLLECTING LOCALITIES

(A map of the localities is given in Fig. 1)

Northern Highlands

1. Addis Ababa, suburb, Shoa province, 09°02'N 38°45'E, 2500 m. - A suburban garden and bungalow situated in the Old Airport district of the capital. Garden plants include roses, Papyrus bushes and Musca plants.
2. Akaki river, Addis Ababa, Shoa province, 09°02'N 38°45'E, 2500 m. - This collecting site at the edge of the city is composed of a variety of habitats. Along the river, there are some patches of riverine forest with dense bushes, but extensive Eucalyptus woodlands are more characteristic. Cultivated fields and fallow plots diversify the landscape. Most of the collections were obtained from the gallery forest, fallowland and the undergrowth of a thin Eucalyptus woodland.
3. Ambo, Shoa province, 08°57'N 37°57'E, 2050 m. - Bushy vegetation on rock ledges around warm spring and waterlogged sedge meadow along stream.
4. "Baboon Gorge"+, near Mt. Termaber, Shoa province, 09°54'N 39°47'E, 3000 m. - This spectacular place is on the western edge of the Ethiopian Plateau, where a 1500 m escarpment abruptly plunges down into the Rift Valley. The vegetation is composed of heavily grazed afro-montane grassland on thin soil with the presence of Thymus plants immediately noticable by their fragrance.
5. Debre Sina, Shoa province, 09°50'N 39°47'E, 3000 m. - Samples were obtained from cultivated fields of teff along the highway.
6. Debre Sina, 20 km north of, Shoa province, 09°40'N 39°45'E, 2800 m. - Similarily to No. 5, heavily grazed grassland with a few scattered herbaceous plants and cultivated fields are the typical habitats.
7. Debre Berhan, 30 km north of, Shoa province, 09°40'N 39°32'E, 2800 m. - Heavily grazed grassland in a landscape typical for the plateau.
8. Degen, Gojjam province, 10°10'N 38°10'E, 2500 m. - Cultivated fields (mainly teff) in grassland.
9. Dessie, Wollo province, 11°07'N 39°43'E, 2700 m. - Collections were obtained in hotel room and overgrown garden in the outskirts of the town.
10. Dessie, 8 km south of, Wollo province, 11°06'N 39°43'E, 2500 m. - A deep narrow valley along the Dessie-Kombolcha road, with Podocarpus trees and lush undergrowth. Euphorbia bushes are characteristic.
11. Fiche, Shoa province, 09°48'N 38°45'E, 2700 m. - Extensive rolling grassland with scattered cultivated fields.
12. Gebre Gurache, Shoa province, 9°50'N 38°30'E, 2700 m. - This locality is similar to nos. 11 and 15.
13. Gibe, river, boundary of Shoa and Kaffa provinces, 08°15'N 37°40'E, 1400 m. - The valley of the river lies some 1000 m below the elevation of the plateau and is therefore considerably drier. Much of the very dry Acacia thorn-scrub was burnt.
14. Ginchi, Shoa province, 09°12'N 38°08'E, 2600 m. - The mountain grassland here is scanty since the vegetation grows on thin soil on volcanic rocks. Many boulders and rocks are scattered in this area.
15. Goha Tsion, Shoa province, 10°01'N 38°17'E, 3000 m. - A soil sample was collected from a hill covered with flowering plants.
16. Holetta, Shoa province, 09°02'N 38°29'E, 2500 m. - Lush mountain grassland.
17. Indibir, Shoa province, 08°00'N 38°57'E, 1950 m. - The plateau around this locality is somewhat lower in elevation than most of the Ethiopian plateau in Central Ethiopia. Grasses are short, cultivated fields, fallows and stands of Eucalyptus are found everywhere.
18. Indibir, 10 km nort-west of, Shoa province, 08°05'N 39°53'E, 1950 m. - See no. 17.
19. Lake Haik, Wollo province, 11°13'N 39°45'E, 2400 m. - The lake is surrounded by cultivated fields and heavily grazed pastures.
20. Hora, Lake, Debre Zeit, Shoa province, 08°44'N 38°59'E, 2000 m. - This volcanic lake is surrounded by some riparian woodlands with more open vegetation higher on the rim of the extint crater.

+ Name taken from ANONYMUS (1978).

21. Menagesha, Mount, Shoa province, 08°55'N 38°37'E, 2900 m. - Collectings were made in grassland at the foot of the mountain (2500 m) and in Juniperus forest and a mosaic of Erica arborea and alpine meadows on the peak of the mount.
22. Menagesha State Forest, Mount Wuchacha, Shoa province, 08°52'N 38°37'E, 3400 m. - A botanical description of this forest has been given by GILBERT (1970). The greatest part of the forest is composed of rather dense Juniperus procera forest with few Podocarpus gracilior trees. At higher elevations Hagenia abyssinica may also be found. There are many ferns in the undergrowth and Lobelia gibberoa bushes. The trees are densely covered with epiphytic lichens, mosses and flowering plants. At about 3000 m, the vegetation changes rather abruptly into a much more open heather zone, with Erica arborea as the commonest shrub, but also many Hypericum recolutum and Helicrysum spp. Finally, at about 3200 m an open, low alpine grassland with scattered Erica shrubs occurs.
23. Meta Ambo, Shoa province, 08°55'N 38°41'E, 2500 m. - This site is in a densely populated area, with many farms and orchards of citrus. A waterfall of about 10 m high and rocky pools below the fall are surrounded by a thin woodland.
24. Shafartak Bridge, Blue Nile (= Abbai) Gorge, boundary of Shoa and Gojjam provinces, 10°06'N 38°17'E, 1150 m. - The vegetation in the gorge is mostly dry, semiclosed thorn-scrub with a strip of riverine forest along the river. The gorge receives much less rainfall than the surrounding plateau, hence the much thinner vegetation.

Southern Dankali and the Great Rift Valley

25. Abiata, Lake, Shoa province, 07°37'N 38°39'E, 1590. - This is an alkaline lake without outlet, with gently sloping shoreline and scanty aquatic vegetation (URBAN, 1969). Expansive sodic plains and very scarce Acacia scrubby grasslands surround the lake.
26. Awash river, Awash National Park, Shoa province, 08°52'N 40°01'E, 1000 m. - A narrow strip of gallery forest bordering the river, 30-50 m wide, with dense bushes on the banks. Dry Acacia scrub on rather bare ground replacing the riparian vegetation within short distance from the river.
27. Baa-sa-ka, Lake, Shoa province, 08°52'N 39°52'E, 1000 m. - An alkaline lake with humic water that lies in an area of lava outspills.
28. Bati, 11 km east of, Wollo province, 11°10'N 40°01'E, 1670 m. - This locality is on the edge of the Dankali. The area is located in a rough rolling hilly country sloping towards the east. After passing a watershed at Bati, the land is becoming increasingly arid towards the east, with the vegetation becoming increasingly thinner. Collections were made in dry Acacia scrub with little ground cover.
29. Bulbula, 5 km north of, Shoa province, 07°45'N 38°38'E, 1600 m. - Overgrazed dry Acacia woodland with thorny vegetation.
30. Illala Sala, Awash National Park, Shoa province, 08°55'N 40°00'E, 1000 m. - This is an extensive plain lying between the gorge of the Awash river and the rugged hills in the northern part of the park. The vegetation is open steppe savanna with tussocky layer of grass. A few thorn-bushes and thickets of Acacia mark the landscape.
31. Karakore, Shoa province, 10°31'N 39°54'E, 1500 m. - A hot-spring supplies water to extenxive marshes with reeds and sedges lying at the foot of the plateau.
32. Kerrayu Lodge, Awash National Park, Shoa province, 08°53'N 40°10'E, 1000 m. - The tourist motel is on the edge of the deep gorge of the Awash river. Its environs is rather bare with thorn-scrub.
33. Koka, Shoa province, 08°27'N 39°06'E, 1600 m. - This locality is an untouched Acacia woodland which lies on the west shore of Lake Koka. The gently sloping bank of the lake is covered with thin herbaceous vegetation, 50-100 m from the shore with a physiognomically structured woodland. Dense patches of Acacia thickets are interspersed with patches of very short grass or even bare ground. Large impenetrable thickets of Opuntia cacti are common in this woodland.
34. Langano, Lake, Shoa province, 07°37'N 38°42'E, 1600 m. - Collections were made on the western shore of the lake only. The vegetation at the foot of high rock ledges above the lake consisted of closed Acacia woodland with an undergrowth of mainly leguminous herbs. At higher elevations on the rock ledges, the vegetation was much thinner, scanty grass with thickets of Opuntia cacti. This area was subjected to heavy grazing. The water of the lake is

humic, though not as alkaline as Abiata, because an inlet and on outlet river ensure the continuous exchange of the water. There is little evidence of either aquatic or waterside vegetation.

35. Meki, 5 km north of, Shoa province, 08°11'N, 38°52'E, 1650 m. - This locality is similar to no. 29.
36. Modjo, Shoa province, 08°36'N 39°07'E, 1600 m. - This is a small township in the northern part of the Rift Valley. Its environs is Acacia savanna, most of it under cultivation.
37. Robi, Shoa province, 10°15'N 38°10'E, 1200 m. - Semi-closed Acacia woodland with thorny herbaceous undergrowth.
38. Robi, 15 km south of, Shoa province, 10°10'N 38°10'E, 1200 m. - This collecting locality was situated in cultivated land where little natural vegetation was left. Apparently on most of the arable fields teff was being cultivated.
39. Sabober Plains, Awash National Park, Shoa province, 08°54'N 39°55'E, 1000 m. - This is a very dry, semi-desert area in the hinterlands of the park. The ground was rugged and rather bare, with few scattered tussocks of grass and thorn-bushes. The area is overgrazed by nomadic Dankali herdsmen, so there was little game present.
40. Sodere, Shoa province, 08°25'N 39°55'E, 1000 m. - This locality is situated in the crater of an extint volcano, the rim of which is no more complete. The Awash river dissects the shallow crater and is bordered by a narrow strip of dense riparian forest. A number of hot springs supplement the flow of the river, around these small marshy areas with reeds and sedges. Away from the river the vegetation is Acacia shrub savanna, with rather structured thickets and short grass between the patches. There is some cultivation, which is irrigated by water from the river. The hot springs feed a number of swimming pools at a nearby popular resort.
41. Zwai, Lake, Shoa province, 07°55'N 38°43'E, 1600 m. - This is the largest among the group of lakes in the central Rift Valley. The township of Zwai is situated on the shore of the lake, which is the only one among the lakes to have extensive aquatic vegetation on its shores.

Southern Highlands

42. Dinshu, Bale mountains, Bale province, 07°06'N 39°47'E, 3200 m. - The vegetation of the Bale mountains has been described by WALTERMIRE (1975). Around Dinshu a generally open Hagenia abyssinica woodland occurs with bushes of Philippia abyssinica and Erica arborea. Alpine meadows around the mountain cabin have obvious plants like Alchemilla, Helichrysum and Lobelia.
43. Dinshu, 11 km west of, Bale province, 07°06'N 39°45'E, 3200 m. - The plateau at the foot of Mount Gaysay (3460 m) is covered with moorland vegetation. Scrubby vegetation of 80-90 cm high comprises Alchemilla, Helichrysum species, with smaller patches of alpine meadows with very short grass.

ACKNOWLEDGEMENTS

I am most grateful to my parents for inviting me to Ethiopia and for their financial and logistic support throughout my stay in the country. I am most grateful to Ato GETACHEW ASEFA and Ato FANTAHUN F. for their valuable help during the field trips, and to the general manager of the Institute of Agricultural Research for permission to cooperate with the staff of the institute. I thank the Permanent Secretary of the Ministry of Agriculture for granting permission to carry out zoological collectings. I am most grateful to the following persons who helped me in various ways during my travels in Ethiopia: Mr. and Mrs. M. MOCK, Mr. and Mrs. KAPÁS, Mr. L. SOS, Ato DAGNEW DANIEL, Ato ABDU MAHAMUED. I would like to express my sincere appreciation to my wife, TÜNDE, for her endurance and invaluable assistance in the field.

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